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ABSTRACT

The purpose of this manual is to assist the reading teacher toward a fuller understanding of the processes and procedures applicable to the teaching of reading using social studies and science materials in the skills lab. For each of the two subject areas, the manual provides an overview, a list of teaching techniques for the various reading skills, and model lessons. An appendix indicates reading materials (with level) suitable for both subjects, and a brief bibliography lists references useful to teachers in organizing and integrating basic skills practices with content area approaches. (JM)

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TEACHING READING SKILLS

THROUGH

SOCIAL STUDIES AND SCIENCE MATERIALS

TITLE I HIGH SCHOOL READING PROGRAMS

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TEACHING READING SKILLS THROUGH SOCIAL STUDIES AND SCIENCE MATERIALS

I. INTRODUCTION:

The purpose of this manual is to assist the reading teacher toward a fuller understanding of the processes and procedures applicable to the teaching of reading using social studies and science materials in the skills lab. The thrust of this work is not directed toward content area specialists but toward reading teachers and what they can do to equip their students to deal with social studies and science concepts and materials.

More and more of us are recognizing the need to integrate some of the special skills of social studies and science reading, as well as some actual content reading experiences, into the lab setting. Beyond this, perhaps some of the successes achieved in the labs can be used to motivate disabled readers who have psychologically, if not physically, resigned from those subject classes in which they found themselves unable to cope with essential materials and concepts. The successes achieved by students in mastering the basic reading skills taught in the labs can be directed toward the teaching of specific content area skills to supplement the basic reading skills diet.

Fortunately, reading labs are already equipped with some materials that can be utilized in content area learning. Most reading teachers will need suggestions and direction in their attempts at integrating content area reading into the individualized programs of students in need of this specific kind of help.

We are, of course, not unaware that content area reading extends far beyond the two fields of science and social studies. This manual, however, is only a first tentative step toward meeting the broad content area needs of disabled readers.

It is our hope that the approaches presented in this manual will prove helpful and constructive to reading teachers first venturing into science and social studies skills and reading experiences with their students. The final section of this manual is devoted to references that teachers may find useful in organizing and integrating their basic skills practices with needed content area approaches.

II. TEACHING READING SKILLS THROUGH SOCIAL STUDIES IN THE READING LAB

A. OVERVIEW:

The ability to read social studies materials at any level requires a mix of skills that depend upon adequate concept development, the understanding of many abstract terms, and an ability to perceive the organization the author has imposed upon his material. There are two major ways in which the teacher in the reading lab can help the poor reader gain confidence in dealing with social studies. First, the teacher provides general opportunities to fill in background deficiencies and improve concept development by making available many different high-interest materials. Such materials include easy-reading encyclopedias, newspapers, current magazines, copies of textbooks used in the social studies room, parallel multi-level texts, audio-tapes, and maps, globes, atlases etc. These materials can be used for on-the-spot clarification of a term or concept or can be assigned to students in need of such help on an individual basis for background purposes.

In addition to this general thrust, the lab teacher may prove invaluable in teaching and reinforcing the specific skills required for the reading of social studies to any student who indicates a need for such assistance. Among these skills are:

1. Specialized Vocabulary Development

2. Comprehension Skills: Besides the more general comprehension skills such as distinguishing between main idea and details and drawing conclusions, the following are peculiar to social studies:

    a. Cause and Effect Pattern
    b. Comparison and Contrast Pattern
    c. Sequential Events Pattern
    d. Fact vs. Opinion Pattern
    e. Graphic Patterns

3. Study Skills

    a. Developing purposes for reading
    b. Using the textbook - table of contents, index, etc.
    c. Organizing information - listening comprehension
    d. Note-taking
    e. Developing flexibility in reading rate - skimming and scanning

SOCIAL STUDIES (Continued)

B. TECHNIQUES:

The small group lesson is an effective technique for teaching and reinforcing the above skills. Group interaction helps the student clarify social studies terms that relate to abstract concepts outside his experience and, sometimes, his conscious interests. With the aid of paraprofessionals in the lab to help individual students, teachers can devote some of their time economically and effectively to short fifteen minute lessons for three to five students with similar skill needs. Occasionally, several students from the same social studies class are programmed into the same reading lab. This is a desirable situation since it allows the teacher not only to utilize one common text but to gear skills lessons to actual assignments, test preparation, book reports, projects etc. Teachers' effectiveness would be maximized if they were to become familiar with the sequencing of content in at least the two required social studies courses in the high school curriculum, American History and Economics. Choice of lab materials can then be made to parallel and support social studies instruction. Reinforcement of the reading skills needed in the social studies is best carried on through the use of existing multi-level, self-pacing materials and the student's own text. Full utilization of lab materials requires the teacher to creatively re-think existing kits and workbooks etc. in terms of social studies. A primary material, hopefully, would be the student's own text to encourage the direct transfer of reading skills to social studies content class.

Once the skill has been taught (see sample small group lessons), techniques such as the following can be used to reinforce the various skills.

1. VOCABULARY:

Vocabulary development is an ongoing activity in the reading lab and is perceived as constantly affecting comprehension where the understanding of key words is essential to meaning. The primary strategies for developing vocabulary in the social studies are through context, structure, and game-like activities.

a. CONTEXT: Using context clues is the ability to apply all available information in surrounding material to discern the meaning of an unfamiliar word or to arrive at a new meaning for a familiar word. Context is a major tool for vocabulary expansion. Reading teachers, then, must give considerable practice in detecting major context clues. Among such clues are: direct explanation, usually synonyms or antonyms, and explanation through example.

(See "Contextual Clues to Vocabulary Meanings" in Small Group Lessons in Comprehension listed in the appended bibliography.

Any of the EDL Social Studies Kit selections (CC, DD, or EE) illustrate pre-teaching of key vocabulary words in context before going into the story itself. Words chosen for pre-teaching are generally the concept-carrying words and time spent on clarifying them in small groups is time well spent.

More advanced practice with context clues can be found in Tactics in Reading/A, pp. 7-28. Here contexts longer than the sentence are explored and the "educated guess" is encouraged.

b. STRUCTURE: If reading is a meaning-centered task, then what is read must make sense. However, the reader of social studies is often stymied in using context to arrive at meaning. The sheer overload of new words may be such that the reader literally does not have enough clues from context alone to make sense out of a passage. Fortunately, clues from structure - roots, prefixes, and suffixes - can provide valuable additional clues. A common core of affixes exists in social studies and once learned can be of real value in vocabulary growth. Commonly used PREFIXES are:

poly-	mis-
demo-	pro-
bi-	mono-
anti-	auto-

SUFFIXES frequently used are:

-crat	-sophy
-logy	-gamy

A student can develop a mental set for affix recognition through the use of games such as Concentration or Affix Bingo, or Password. However, a word of caution is in order. Affixes taught should be limited to either those with a single meaning, such as "circum," or with a restricted meaning such as "de" meaning "of", "from," but also "down" as in "decline." Avoid prefixes with so many multiple meanings that confusion will result. Reinforcement of structure might be through HIGH VISIBILITY methods. One such technique is to display word trees (word families) in the lab.

---Suggested practice: Tactics/B, pp. 27-37. Roots and affixes used to build words for an archaeological selection.

c. GAME-LIKE ACTIVITIES with words can be fun while reinforcing. Success With Words provides numerous examples of such exercises involving social studies vocabulary. One such reinforcement is the Word Puzzle where a definition is given and the student must recall the appropriate word. Reading skills involved, besides recall, are visualization of the parts of the correct spelling of the word. This technique is especially helpful in "fixing" abstract terms common to social studies.

Categorizing words helps students to generalize and develop a sense of organization. Activities where students are required to place a word under a correct heading (ex., Agriculture, Government, and Trade) are useful in concept development and in relating main ideas and details.

Word recognition techniques using sentence exercises with frequently confused social studies words help in clarifying meaning differences between both similar spellings ("country" vs. "county") or between totally different words such as "pioneer" and "migrant" with somewhat similar or opposite meanings.

2. COMPREHENSION:

Only as a student understands the concept which is labeled by a word is the student able to think about social studies ideas (see bibliography, Shepherd, p. 190). Concept development depends upon direct background experience or simulated exposure to ideas through multi-media, discussion etc. However, even when the reader is able to handle the text conceptually, he often needs help in perceiving certain organizational patterns that aid in reading new material with ease and understanding. Several of these patterns are discussed below.

a. CAUSE AND EFFECT PATTERN: Although this organizational pattern occurs in other subject fields, it occurs with highest frequency in social studies. Every major event in history comes about as the result of some cause or causes and results in felt or seen effects. Since the cause and effect pattern is such a common one, direct practice must be provided in the lab with both the student's text and with exercises - especially where the effect appears first in the paragraph, section or chapter and the causes follow (see bibliography, Smith, p. 11). The following are suggested exercises:

---Be a Better Reader, Book C has an interesting article on the "Problems of India" (pp.106-09) where the student must write in his own words the cause or effect when its opposite is given. Writing the answer forces the student to organize his thoughts and summarize them.

---Tactics in Reading/A (pp. 113-134) devotes a section to relationships where time order (sequencing) and cause-effect are examined jointly in increasingly difficult material. Although not all the exercises are specifically social studies oriented, the final activity is.

---Easier material can be found in GO Reading in the Content Area(6). An example would be the article on immigration, "They Came to America", which interrelates cause and effect with time sequence and the use of the time line.

---"The Growth of Cities" in Critical Reading and Listening Study Guide (Set E, pp. 25-28) uses the cause and effect pattern as a comprehension check.

Note: Materials do not always indicate that the content is social studies or that a particular pattern is being taught. The teacher must ferret out much of this information.

b. COMPARISON AND CONTRAST PATTERN: "This pattern is most frequently encountered in a discussion of such coordinate and similar topics as: differences in theories of government, policies of different leaders; physical features, products or industries of different countries; the past and present condition of peoples in certain countries, and so on." (Smith, p.11). Suggested materials are:

---"Problems of India," Be a Better Reader, Bk.C, previously cited as an exercise for development of cause and effect might also be used to develop the sense of comparison and contrast - the old and the new India. The same social studies selection can be utilized, then, to reinforce several different skills. However, the teacher should focus on only one skill at a time so that the assignment does not become too difuse.

---"The Story of Sweets," (EDL Social Studies Kit, CC-7) could be used as a group lesson for poorer readers. EDL always provides two practices on a skill.

The first one relates to the story and the second one is self-contained with its own reading passage. The latter exercise could be used to teach the process and to set a purpose for reading the selection itself.

c. FACT AND OPINION PATTERN: (especially the propaganda pattern) Although fact vs. opinion can effectively be taught by using the news article vs. the editorial in the daily paper, the skill can also be practiced through critical reading selections. Some materials that give students practice in detecting authors who wish to convince readers of a point of view are:

---For better readers Tactics in Reading/B has a well-developed section on Judgments (pp. 119-140) in which several aspects of logical thinking - besides Fact and Opinion - are explored. Some of these topics are:

Jumping to Conclusions - personal motives
Recognizing Stereotypes
Valid Opinions
Making Judgments - combining facts and opinions

---"The Aztecs of Mexico" (EDL S. S. Kit, EE-1) includes exercises on verifying statements which relates to the fact/opinion skill in which the student determines by actual proof when statements are true, false or not given. Here, again, the teacher is alerted to the fact that the skill is not listed as fact/opinion but does serve to reinforce that skill.

d. GRAPHIC PATTERNS: The ability to read and interpret graphs, charts, pictures, cartoons and maps is a valuable supplemental aid in obtaining information from the printed page. In social studies, especially, relationships are often conceptualized in graphic form. The process itself might be seen as one of moving back and forth between print and symbol and integrating the information obtained from each.

On a beginning level this often involves teaching that captions under pictures are not part of the text. Especially when the graph or picture appears in the middle of the page, the poor reader often misses the change-in-print cue and reads the caption into the text with resultant confusion.

Often a picture is presented without calling attention to details and implications. A wealth of information can be obtained from interesting pictures in social studies and reading teachers should increase their efforts to sensitize students to the

usefulness of pictures giving them much practice in "reading" pictures and more sophisticated cartoons. (Smith, P. 11)

Interpreting tables, charts, and graphs, which appear with frequency in economics, requires practice with the different formats so that the poor reader is not fearful of attacking something that looks more complicated than it is. Besides teaching the graphic pattern with the actual graphs, charts etc. as they appear in the text and, when the student indicates he needs help with the skill, the following reinforcing activities are suggested:

---Basic Reading Skills has a section on uses of different types of graphs (bar vs. circle), plus charts, maps etc.

e. MAP AND GLOBE SKILLS: The reading of maps, globes, and atlases is the most highly specialized kind of reading in the social studies. Skills such as recognizing and interpreting symbols for rivers, mountains, lakes, boundary lines, scale of miles, color keys, meridians etc. are required. Relationships between data presented on maps must be discerned and inferences and logical conclusions drawn from the data. Suggested procedures might include the following:

---A lesson on using the subway map to get to and from various locations in the city.

---Introdicing the SRA Map and Globe Skills kit. Allow interested students to work in pairs and proceed sequentially through the material. Some poorly motivated readers, who are visually oriented, can tolerate reading if it is in small doses and is seen only as an adjunct to something they like better - in this case working with maps or handling globes.

---Display one or two topical questions for use with the wall map or globe and change questions regularly. Encourage "hands on".

3. STUDY SKILLS:

"The study skills are those which enable the student to attack a reading assignment in accordance with a stated purpose, to locate information, and to determine the structure of thought of the author." (Shepherd, p. 191) Only two of the study skills will be

examined here. They are the use of the textbook and developing flexibility in reading rate.

a. USE OF THE TEXTBOOK: Students who flounder in subject classes are often in awe of their text. These students need some textbook survival skills. In social studies this is particularly true because of the sheer quantity of expository reading required.

At the beginning of the term the lab teacher can help the student get off to a good start in his social studies class by discussing with him the overview of the text obtained from the table of contents and giving practice in locating information both from it and from the index. Also, a look at the first chapter or unit of the book will expose the student to the technique of surveying or previewing units for information.

For practice excercises for poor readers see Dexter and Westbrook's New Series (A-E):

Using the Index
Using the Table of Contents

On a higher level, BABR, Bk.I has a Table of Content exercise, pp. 82-83, in connection with a supposed article on progress in transportation.

b. DEVELOPING FLEXIBILITY IN READING RATE: The concept that all reading need NOT be careful reading and that there are times when it is important NOT to read everything is a new and frightening idea to the poor reader. Yet this ability to be selective about what is read and NOT read becomes increasingly important as the student moves up through the grades. Nowhere is this more apparent than in the social studies where the number of pages assigned to be read in a homework can be overwhelming. Skimming and scanning (actually very rapid skimming) are two skills which the student should develop to handle heavy reading or research assignments.

Skimming is used in the overview or preview of a selection to get the general content. All directed reading assignments in the social studies materials in the lab (EDL, CRL etc.) use the previewing technique where the reader skims through a selection, noting only titles of sections, captions under graphs, pictures etc., and reads only the first two or three paragraphs and the final summary to grasp the main idea.

If the preview technique is to lead into careful reading then the student must shift gears in his rate of reading. He should also be helped in setting a purpose for reading by formulating questions from the topical headings. Moreover, it is extremely important that the teacher emphasize the amount of information the student has obtained through the preview alone which, with the knowledge he brings to the text from experience, results in a much higher entry level into the text than if he had plunged in "cold".

Scanning, or very rapid skimming, is another way of leading students away from word by word reading. Often the student needs to use a text or reference book to search out a single fact, the answer to a single question or one aspect of a topic. High speed scanning locates the item quickly thus saving the student valuable time.

A suggested scanning lesson would utilize a page from a social studies text containing many factual details such as dates, proper names, places or numbers. The teacher prepares a series of questions, numbers the lines of the selection for easy reference, and gives small group practice in rapidly locating required information.

---Reinforcing activities can be found in the chapter entitled "Streamlined Reading" (Advanced Skills in Reading I, pp. 93-104). Use of lists, charts, schedules, indexes, table of contents etc. provide many short and varied scanning exercises. (Note use of the general term skimming for what is here termed Scanning).

---Newspaper reading provides many opportunities for both skimming and scanning. Shepherd (p.196) gives the following plan of attack in reading the newspaper.

1. Skim all headlines on the front page.
2. Skim through entire paper. Make mental notes of what is to be read in more detail later.
3. Read the news stories on the front page. Sometimes the first one or two paragraphs of an article will suffice.
4. Read widely throughout the paper. Select the most interesting articles.

C. MODEL TEACHING ACTIVITIES FOR SOCIAL STUDIES IN THE READING LAB

I. LESSON - SOCIAL STUDIES: Distinguish Fact from Opinion

Motivation:

Use cartoons shown on page 134 of Tactics in Reading B (Scott, Foresman and Company, 1973).
"I read in the papers that ....."
"I heard on T.V. last night that ....."
"My teacher said that ....."
"A book I'm reading states that ....."

Each of the above statements is the beginning of a statement of A)fact, B)opinion, C)both, D)neither
(Ask the class to decide; poll the results and list them on the board).

What is the difference between a fact and an opinion?
(elicit responses)

How would you change each of the cartoons to a statement of fact?

1. It's a fact that the dancing teacher has said that dancing is the best means of self-expression.
2. The truth is that the teenager in our household believes that adults are hard to get along with.
3. Everybody in our science class knows that a skylab was launched by the U.S. on May 14, 1973.
4. You saw that the mayor of Cleveland was elected for another term.

Each of the above statements can be proven by asking the appropriate people.

Development:

The people who write social science material use both fact and opinion in their writing. Although two writers use the same facts, their opinions can make you think very differently about the facts. For example:

Writer #1 -

The Middle East is one of the poorest regions of the world. It is poor in resources, in industry, water, and farmlands. We would expect the people to be very poor, since most of them depend on farming to make a living.

Writer #2 -

Most of the people living in the Middle East are farmers. There are many people, but the land has little to give them. There is not much industry and the region has few resources, water, and farmlands.

Which writer is giving an opinion? Which writer allows the reader to judge for himself? Do both writers present the facts? What words indicate that the writer is expressing an opinion?

LESSON - SOCIAL STUDIES (continued)

Several questions should be asked about the writer of any article. Who is he? Do you know anything about his background? What experiences have led him to form his opinions? Is he only giving one side of an issue?

The following are two accounts of the Russian Revolution of 1917. As you read, try to figure out who the author was and what his point of view might be.

I. During 1917, a revolution took place in Russia. The working people overthrew the czar, a Russian King. The czar and his family were killed. Everyone longed for freedom. They had never had it under the czar.
Under the slogan, "All power to the Soviets," a new government was formed. It was a dictatorship of the people. At last the people had their own government. All land was owned by the government. Since the government was the people, the people owned all the land.
The government also took over the banks, factories, mines and stores.
The people then owned everything.
The Communist party was the wise leader of the working people. It led the people along the right path. It led them to liberty and a classless life. The Revolution was a people's revolution. It threw out those who would make slaves of the workers. It established the dictatorship of the people.
The Revolution brought a new life to all mankind. It brought them the victory of communism.

II. In 1917 The Russians revolted against their czar. The Communists cruelly killed the czar and his family. The Russians hoped to win freedom.
Most of them hoped that the Russian Revolution would make their lives better. The Russian peasants hoped to divide the land among themselves. The workers wanted better wages. They wanted their living conditions improved.
After the bloody revolution, a new government was set up. It was a government controlled by Communists. It took over all the property owned by the people. The property became the property of the government. It took over factories, banks and stores.
The people did not get what they wanted. They did not control the government. The government was controlled by the Communist party. No one could disagree with the party. Those who tried to disagree were put in jail or killed.
The Revolution made the Soviet people slaves of their government. It took away their religion. It took away their property. It took away their freedom.

The first was written by a Soviet writer for a Soviet textbook and the second was written by an American writer for an American textbook.

LESSON - SOCIAL STUDIES (continued)

List the facts stated in both accounts. (List the following on board as elicited)

1. The Russian Revolution took place in 1917.
2. The czar and his family were killed.
3. The people had high hopes for the future.
4. The government owned everything after the revolution.
5. The new government was led by the Communist party.

Go back and find these facts in each version.

Among the opinions stated in the two articles,

1. Which writer presents the Russian Revolution as a tragic event in history?
2. Which writer believes that Communism is the best way of life?
3. Which writer presents the czar as a negative figure?
4. Which writer presents the new government as an improvement over the old?
5. Which writer tells his story by adding his own ideas to the facts?

In answering each of the above, defend your answers.

Summary:

Different writers can have different ideas about the same facts. The way the facts are presented influences the way they will be read and understood. It is the reader's job, then, to study the material carefully in order to separate the fact from the opinion. One of the ways this is done is by learning about the author. What are other ways to distinguish the facts from the opinions?

Other Practice Ideas:

1. Read a statement from a newspaper, magazine or textbook.
2. Question students as to whether it is a statement of fact or opinion. Students must defend their positions.
3. Repeat the process.
4. Elicit examples of fact and opinion from students daily readings.
5. Explain clue words to the students ("claims, believes, thinks, considers, said to be, probable, etc.") Elicit other clue words which might indicate opinion rather than fact.
6. Name some items that might express opinion without clue words because of their very nature (Advertisements, Editorials, Speeches, etc.) Elicit others.
7. Define a statement of fact and a statement of opinion. (Facts can be proven by reliable sources)
8. Review by presenting statements and asking students to decide whether they are fact or opinion.

Sources:

Read Better, Learn More Book C (Ginn and Company, 1972)
Tactics in Reading B (Scott, Foresman, 1973)

Prepared by: BOB FREDERICKS

C. MODEL TEACHING ACTIVITIES FOR SOCIAL STUDIES IN THE READING LAB

II. LESSON - SOCIAL STUDIES: Cause and Effect

Motivation:

Show following pictures to small group:

1. Birdcage with door left open and bird escaping.

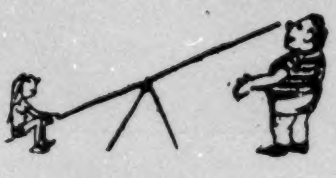
2. Child on seesaw in first panel who rises when heavier child gets on.

Have pupils verbalize what happened in each two panel cartoon. What happened? What made it happen?

1. a

2.b

1. a



2. b

Development:

1. Look at cartoons on p. 119 of Tactics in Reading/A, and complete sentences. Do p. 120.

2. What are some words which show cause - effect relationship? (p. 121) Elicit:

because	therefore	for this reason
since	consequently	then
as a result	so	the reason is / was

LESSON - SOCIAL STUDIES (continued)

3. Sometimes a main clause shows the result when the introductory clause starts with when:

   a) When the weather is very hot we perspire a lot.

   or

   b) If a batted ball is caught, the batter is out.

4. All of the above are clues to the cause - effect relationship.

5. Have small group do pp. 126-127 of Tactics in Reading/A.

Applications by Reading Level:

1. For pupils reading below 5.0 use:

   a) Critical Reading and Listening Guide - Set C., "Puerto Rico", C-61, pp. 1-4.
   b) Be a Better Reader. Book A, pp. 110-112.

2. For pupils reading around 6.0:

   a) Read "The Long Trail," pp. 53-54, in GO Reading in the Content Area (6). Match pictures on p. 55 for cause and effect.
   b) Read "They Came to America," pp 66-69 in GO (6). Do "Think About It," p. 69.

3. For the advanced reader:

   a) Read "The Egyptian Society," in Critical Reading and Listening Study Guide (set F), F43, pp. 9-12. Questions 1-5 on p. 12 are cause - effect questions. These are difficult. Find the section in which each topic is discussed. Reread these sections to find the causes and effects. Look for the signal words already listed.

Prepared by: PAULETTE DIAMOND

C. MODEL TEACHING ACTIVITIES FOR SOCIAL STUDIES IN THE READING LAB

III. LESSON -SOCIAL STUDIES: Use of Context Clues to Determine Meaning of Words

Motivation:

Discuss with small group the following questions:
a.) Why do people move to the city?
b.) Why do people move out of the city?

Procedure:

1. Distribute copies of the following paragraph to the group.

   Years ago the population of our country was largely rural. Most people lived in the country or in small towns and many of the people were farmers. In the second half of the 19th Century new methods of manufacturing (making things by machine) led to the growth of urban centers, or cities. Because of the promise of high wages, many people migrated to the cities while fewer people remained on farms. This was one of the chief reasons why the population of the country shifted from being rural in the past to urban in the present.

2. Explain to students that they are going to look for clues to help them find the meaning of the underlined words and that such clues are called context clues.

3. Elicit meaning of population. Have students read the sentence in which the meaning is found. "Most people....." Point out that the meaning of population is not found in the same sentence in which population appears but in the following sentence. This context clue is indicated by restatement.

4. Ask students to reread the first two sentences of the paragraph for the meaning of rural. Explain that the clues used here are examples.

5. Ask students if they can find in the paragraph another way to find the definition. One example is: "manufacturing (making things by machine)." Call attention to the punctuation clue, the use of parentheses to set off the meaning.

6. Ask students to locate another example of a punctuation clue. Ex. "....urban centers, or cities." Explain that cities is a synonym and is often set-off from the word it explains by comma(s).

7. See if students can deduce the clue to the last word, migrated. Let them arrive at the meaning through discussion and by referring to the text. Explain that the clue used here is one of contrast (migrated vs remained).

Application:

1. For students reading at 6.0 or below:

   Read "A Nation of People - And Cities!" pp. 70-75 in GO Reading in the Content Areas (6).

2. For students reading above 6.0:

   Do exercises, "Two kinds of Context Clues," pp. 10-12 in Tactics in Reading /B.

Prepared by: M. JEANNE WORRELL

III. TEACHING READING SKILLS THROUGH SCIENCE IN THE READING LAB

A. OVERVIEW:

Success in working with science material requires all of the skills mastered in the reading lab, particularly finding the main idea, recognizing supporting details, determining cause and effect, understanding sequence, and following directions. The disabled reader struggling to understand his science textbook, and his science teacher, rapidly recognizes the necessity of mastering the specialized vocabulary of the sciences.

Frequently overlooked, vitally important if the student is to achieve success in his science schoolwork, is the need for him to be able to relate what he is learning in the classroom and in the reading lab to what he already knows about everyday life. In this respect, the reading teacher, within the individualized structure of the reading lab, is in a unique position to help the student deal with content area reading.

B. TECHNIQUES:

1. VOCABULARY:

The preteaching or reinforcement of specialized vocabulary requires that the teacher determine the level of the student's pre-existing knowledge. There is no point in trying to teach the term "dendrite", for example, unless the student is familiar with the concepts underlying "nerve" and "fiber". On the other hand, some students may be at home with a word like "base", not realizing that it has a meaning in science entirely different from what it means in mathematics or sports.

In addition to the highly specialized language of science, including such terms as miosis and mitosis, stalactite, stalagmite, magma, hematode, vertegrate, etc., there are many multi-meaning words which the student may encounter in other contexts, particularly math. Students will be confused if they try to apply their math knowledge in the science context. Some examples are inversion, base, solution, radical, and plus. The reading laboratory teacher can help to reinforce the acquisition of these terms in their science context through the use of specially constructed puzzles and word games. (See section IV for possible sources.)

It is important for the reading teacher to consult with the science teacher to determine the key

words for a given unit or chapter, and to stress these words, as most students cannot and should not be expected to memorize long lists of difficult new words. The key to success is repetition in a variety of ways of the most important terms.

2. MAIN IDEA AND DETAILS:

The most obvious use of main idea - detail organization in the sciences is found in the description of an experiment. The purpose of the experiment, or hypothesis, is the main idea the student has to keep in mind. The steps he follows to prove the hypothesis are the supporting details. This might be a good way to introduce the concepts of main idea and details to a student who knows something about an experiment, who has seen one done, or, ideally, has performed one himself in his science class. It is essential to relate all new concepts to the student's own experience, to build on what he already knows.

Another common use of main idea - detail organization is found in the description of processes such as sedimentation or volcanic activity in earth science, reproduction in biology, or reaction of two substances in chemistry. Again, it is important to select essential concepts to stress and to relate them to something with which the student is already familiar, such as what happens when you drain the bathtub, what goes on inside a teakettle, etc.

3. CAUSE AND EFFECT:

Determination or recognition of cause and effect relationships is another common, essential tool a student must learn to use in order to succeed in science. Hormonal activity triggers metamorphosis in insects. Light stimulates heliotropism in plants. Wind, water, and gravity cause erosion of rocks, in turn the process which forms soil.

Cause and effect appears to be a fairly clear cut relationship, but students are often confused by sequential steps or even simple lists. The teacher must point out that simply because one event happens before another, or because one item appears on list before another, the first one is not necessarily the cause of the second. A similar problem in social studies reading is created by the historical order of events which are not necessarily in a cause and effect relationship.

4. SEQUENCE:

In doing an experiment, unless the proper sequence of steps is followed, disaster may result. A clear understanding of the order of steps may be taught by using a recipe format. It becomes readily apparent to the student that he can't eat the brownies until he has taken them out of the oven, he can't take them out until he has put them in, etc. This metaphor can then be extended to the experiment description.

Understanding sequence is essential to learning the steps in miosis and mitosis, the metamorphosis of insects, the composition of the air layers surrounding the earth, or the function of the digestive and circulatory systems, to name only a few examples. Without this very basic tool, almost all of science will remain incomprehensible to the student.

5. FOLLOWING DIRECTIONS:

Basic to many real life situations outside any classroom, the ability to understand and follow directions is of the utmost importance to any student going into a science laboratory situation, as well as necessary to his understanding of the text. Active physical danger can threaten someone who pours the water into the acid, or who neglects to turn off his Bunsen burner and allow the glass to cool. The reading lab teacher must reinforce this skill from the beginning, informally, in the way in which the student is taught to function in the reading lab; getting out his folder, reading the assignment sheet, finding the right material and keeping his own records. Many teachers start the year with a bulletin board illustrating the steps to be followed via diagrams and texts.

Following directions is another skill which can be taught more formally through lessons related to the understanding of experiments. It lends itself ideally to actual physical activity on the part of the student, if this can be arranged.

CONCLUSION

Any of these organizational devices are likely to occur together. For example, to read an experiment, the student deals simultaneously with main idea - sequence, following directions, and cause and effect. When reading about the geological process through which the earth as we know it now developed, he must be able to handle main idea - detail, sequence, and cause and effect, all more or less at once. When teaching and reinforcing the processes of reading in science, as in any other subject field, it is important to remember this, and to emphasize to the student that there are many different reading techniques to be used together to become a more able student.

C. MODEL TEACHING ACTIVITIES FOR SCIENCE IN THE READING LAB

1. LESSON - SCIENCE: Previewing a Chapter

Purpose:

To provide students with the necessary frame of reference (vocabulary and concepts) necessary to read a textbook chapter.

Aim:

Students will identify the title and the boldface headings used in a textbook and be able to answer questions based on these cues before reading a chapter.

Step 1
Write on board:
Eating for better health
Digestion begins
Digestion goes on
Digestion is completed
A balanced diet

Have students decide:
A. What the chapter is about
B. What details each sub-heading will contain
C. What type of illustration the author should include

Step 2
Write the title of a short article on board.
Have students decide what the article will be about.

Step 3
Distribute rexographed copies of the article. (Make sure the boldfaced headings stand out on the rexograph).
Instruct students to read only the boldfaced headings.

Step 4
Have students answer questions based on the headings.

Step 5
Direct students to read article.

Step 6
Discuss how the title and the boldfaced headings assisted the students in anticipating the information contained in the article.

Step 7
Turn to students' textbooks and repeat steps 2 - 6 substituting the text for the rexographed article.

Prepared by: BARBARA ERDMAN

C. MODEL TEACHING ACTIVITIES FOR SCIENCE IN THE READING LAB

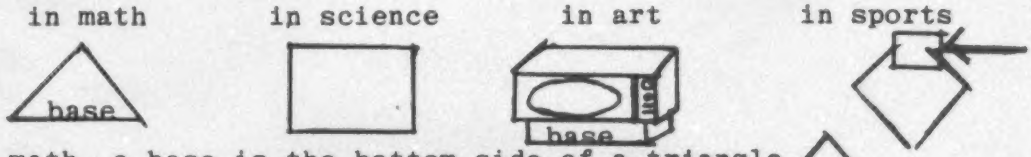
II. LESSON - SCIENCE: Multiple Word Meanings in Content Area

Same words. Same spelling. Different meanings.

Directions:

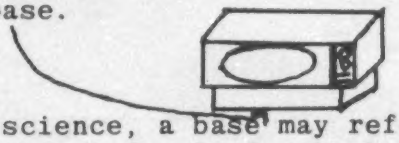
Read. Look at the illustrations. Re-read. Fill in the sentences.

A.



In math, a base is the bottom side of a triangle or the side that the triangle rests on.

In art the bottom section that a cabinet rests on is called a base.



In science, a base may refer to a part of a plant or animal, the base of a leaf, the base of the skull.

1. In _____ the base of a triangle is at the bottom.
2. This triangle rests on its _____.
3. In sports, the ball player touches home _____.
4. My T.V. set sits on its _____. The base is down on the _____.
5. In science, the leaf is attached to the stem at its _____.

B. In science a solution is a solid dissolved in water. Salt in water is a solution.

$NaCl + H_2O$ = solution

Sugar in coffee is a solution.

In math the way to solve a problem is called a solution.

Problem:
Which is cheaper? 3 oranges for 25¢ or 8¢ for one orange?

Given: 3 for 25¢ 8¢ each

To find: Which is cheaper?

Solution: 3 X 8¢ = 24¢
3 for 25¢

Subtract 25
-24
1¢ Solution

Orange for eight cents is the cheaper way to buy oranges.

Fill in the blanks:

1. In math the way to find the answer to a problem is called a _____.
2. In _____ a solution is salt in water.
3. When you put sugar in coffee, you have a _____.

C. In your home the T.V. set and refrigerator work on electric power. Con Ed sells power to you. That power makes electrical appliances work.

No power = no lights
No power = no T.V.

In math when you multiply three 3's you can write it:

3 X 3 or 3 times 3 or 3^2

In math 3^2 = three squared = 3 to the second power.

$4^3 = 4 \times 4 \times 4$ = 4 cubed = 4 to the third power.
How many times do you multiply the number by itself?
That is the power of the number

Fill in the blanks:

1. In _____ 3^2 = three to the second power.
2. In math 5^2 = five to the second _____.
3. In your home, Con Ed sells you electric _____. This power makes, T.V., _____ and _____ work. We pay money to buy _____ from Con Ed.

Now write some sentences of your own. Use power, base and solution in sentences.

Look up these pairs of words. Maybe you can explain their use and different meanings.

root in math	radical in math
root in biology	radical in history
star in science	union in math
star in movies	union in history
cell in biology	
cell in social studies	

Prepared by: HARRIET SIEGEL

C. MODEL TEACHING ACTIVITIES FOR SCIENCE IN THE READING LAB

III. LESSON - SCIENCE: Organizing a Chapter

This lesson is directed toward a small group, and it uses the material in the textbook for two purposes:

1. To teach the reader about Learning and Behavior (the focus of chapter 38 in Pathways in Biology[1] - Oxenhorn, Globe Book Co., New York, 1975.)

2. To teach students a way of organizing information in a chapter to help them recall and study.

Aim: The students will set up a worksheet and will be able to organize topic headings into questions to structure the information.

Motivation:

Cover Columns B and C with a piece of paper. Now read Column A three times. Write as many of the words as you can remember in the correct order on a sheet of paper. Repeat the procedure for Columns B and C.

A	B	C
Biz	Yes	John
Waab	Dog	And
Omt	Harry	Mary
Borl	House	Went
Daj	Moon	To
Raf	Two	The
Hicaw	Cold	Party
Arb	Not	Together
Sma	Bet	Last
Vilf	Was	Night

Answer Questions 1 through 4:

1. Which column was easiest to remember?
2. Which column was the hardest to remember?
3. How do you explain the difference in your ability to learn the ten items in each column?
4. How can this experiment help you in studying?

After doing this mini-experiment with the youngsters, they will answer the questions and reach the conclusion that is easier to recall information that is meaningful.

Procedure: (with the teacher)

1. Duplicate the first paragraph in lesson 38, which is numbered 38-1, and ask students to turn the heading into a question. Thus the Meaning of Learning becomes What Is The Meaning Of Learning? Now have each student cross out every sentence

[1] p. 259

that does not answer that question:

[1]38-1. The Meaning of Learning

Reflexes and instincts are inborn, unlearned acts. But what is learning? Learning means that an animal acquires new responses from its experiences. Using its basic reflexes, the animal develops new pathways for response. Learned behavior makes use of the cerebrum in addition to the spinal cord, medulla and cerebellum.

Can you teach your pets? Many of them are able to learn simple responses. When your dog wants to go out, it has learned to scratch at the door. Your dog barks for candy or for you to play with it. Other animals can learn too. A squirrel "learns" to sit up and beg for a nut. Bears are taught to dance; seals are taught to play ball or honk horns. Horses at the track start to run when they hear the starter's pistol. If you keep a fish tank try this experiment. Tap the sides of the tank; drop some food on the surface of the water. Do this for about a week. At the end of the week, tap the tank without scattering food. The fish quickly respond to your tap and come to the top. You have "educated" fish.

These responses of the dog, fish and other animals are examples of learned acts. Certainly they differ from our doing a jigsaw puzzle, typing a letter, or fixing a car. But they are acquired or learned.

2. Instruct the student in how to set up a worksheet with a question and an answer for each topic in the chapter.

Example:

	Q	A
38-1	What is the meaning of learning?	Learning means that an animal acquires new responses from its experiences.

3. Students working by themselves.
Students will make questions out of all the topic headings, find the answers and put on their worksheets.

4. Review - The group will go over all questions and answers. They will discuss whether or not this method makes the material more meaningful and therefore easier to recall.

[1]Oxenhorn, op. cit., p. 253

5. Students will answer the questions at the end of the chapter.

[1]A. Choose Another Title For Chapter 38.
   1. Learning is Changed Behavior
   2. Education is Important
   3. All Learning Comes from Books
   4. Man is the Most Intelligent Animal

B. In Which Section Can This Information Be Located?
   1. How can you teach a dog new tricks?
   2. What do we call a change in reflex?
   3. How can you break a bad habit?
   4. How are learning and personality related?

C. How Much Do You Remember?
   1. Closing your books when the class bell rings is an example of a (an)
      a. reflex.
      b. habit
      c. instinct.
      d. voluntary act.
   2. Memory and learning are involved in
      a. typing correctly.
      b. knee jerk.
      c. mouth watering.
      d. growing normally.
   3. When a dog's mouth waters at the sound of a bell, the dog has
      a. formed a habit.
      b. learned to think
      c. been poorly trained.
      e. been conditioned.
   4. Trial and error describe
      a. habit formation
      b. conditioning.
      c. a form of learning.
      e. inborn reflex behavior.

It is important to note that these questions emphasize the importance of using the information in a text to reinforce reading skills.

Prepared by: MIMI CHODOSH

[1]Oxenhorn, op. cit., p. 258

IV. SUMMARY:

Social studies and science materials usually found in the reading lab are categorized in High School Reading Taxonomy: A Guide to Materials. These materials have been listed in the appendix of this manual.

In order to help our students with content area reading problems, a content corner furnished with copies of texts used in subject classes might be set aside in the lab. This corner could also be stocked with such content area skills materials as the Go series, the E.D.L. Skills Series and the Be a Better Reader workbooks.

A Reading Manual and Taxonomy for the Social Studies Classroom, although specifically designed for use in the social studies classroom, is also helpful for integrating social studies topics into the specific skills orientation of the reading labs. It provides a broad listing of social studies topics, the skills that may be developed from them, and references with approximate reading levels, to a number of texts used in the schools.

Sources which provide model lessons in science and social studies, among others, are Reading in the Content Areas, and Teaching Reading Skills Through Social Studies and Science Materials. Each model lesson plan is preceded by an introduction and a section outlining the procedures to be followed in using the lesson with a small group.

These resources, in addition to the overviews and model lessons provided in this manual, are designed to provide reading teachers with a foundation upon which to develop their own materials and approaches in response to the specific needs of their students.

V. APPENDIX

Some Social Studies and Science Reading Materials

Level	Material
M-H	Basic Reading Skills
E-M	Be a Better Reader
E-M	Critical Reading and Listening Study Group
H	Developing Reading Skills
H	EDL Study Skills Library
E-M	GO -Reading in the Content Areas
H	New Practice Readers
E	Scholastic - Map Skills
E	Skilpacers
M	SRA Dimensions - Countries and Cultures
M	SRA - Map and Glove Skills
E-H	SRA Reading Laboratories
H	Success With Words

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